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Geographical variation in the prevalence of heavy drinking in young Swiss men

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Abstract: Background: Not much is known about how much geographical units matter for heavy alcohol consumption and how much of the geographical variations are explained by characteristics such as institutional alcohol policies and regional economic conditions. The study aim was to address these gaps considering three types of heavy alcohol consumption. Methods: Analyses were based on data collected on 5879 men (age: 20.0 years, standard deviation: 1.2) years participating in the Cohort Study on Substance Use Risk Factors in Switzerland. Generalized linear mixed models were used to assess overall prevalence, geographical variations in prevalence across geographical units (institutional units, economic micro regions, linguistic regions, urban/rural status), and explanatory variables in three different types of heavy alcohol consumption (heavy weekend drinking, heavy workweek drinking, heavy volume drinking). Results: The overall prevalence for heavy weekend drinking was 46.8%, 10.8% for heavy volume drinking and 3.6% for heavy workweek drinking. The extent and locations of geographical variation in prevalence rates were contingent upon the type of alcohol consumption. Institutional alcohol policies explained substantial geographical variations in heavy weekend drinking, but not in heavy workweek or heavy volume drinking. Regional economic conditions were not related to alcohol consumption. Conclusions: Different types of heavy alcohol consumption are determined by different geographical units. Alcohol policies protectively impact the major drinking style of heavy weekend drinking, but not other low prevalence forms of heavy drinking. Research and public health efforts must take into account these differences between types of alcohol consumption.

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ABSTRACT

Background: Not much is known about how much geographical units matter for heavy alcohol consumption and how much of the geographical variations are explained by characteristics such as institutional alcohol policies and regional economic conditions. The study aim was to address these gaps considering three types of heavy alcohol consumption.

Methods: Analyses were based on data collected on 5879 men (age: 20.0 years, standard deviation: 1.2) years participating in the Cohort Study on Substance Use Risk Factors in Switzerland.

Generalized linear mixed models were used to assess overall prevalence, geographical variations in prevalence across geographical units (institutional units, economic micro regions, linguistic regions, urban/rural status), and explanatory variables in three different types of heavy alcohol consumption (heavy weekend drinking, heavy workweek drinking, heavy volume drinking).

Results: The overall prevalence for heavy weekend drinking was 46.8%, 10.8% for heavy volume drinking, and 3.6% for heavy workweek drinking. The extent and locations of geographical variation in prevalence rates were contingent upon the type of alcohol consumption. Institutional alcohol policies explained substantial geographical variations in heavy weekend drinking, but not in heavy workweek or heavy volume drinking. Regional economic conditions were not related to alcohol consumption.

Conclusions: Different types of heavy alcohol consumption are determined by different geographical units. Alcohol policies protectively impact the major drinking style of heavy weekend drinking, but not other low prevalence forms of heavy drinking. Research and public health efforts must take into account these differences between types of alcohol consumption.

Keywords

alcohol drinking; geographical variation; alcohol policy; economic conditions; generalized linear mixed model

INTRODUCTION

Geographical variations in alcohol consumption are well documented¹⁻² and important for several reasons. First, assessing geographical variations reveals risk areas that have to be prioritized for public health initiatives. Second, geographical variation may point to different alcohol-related risk exposures. Third, because alcohol consumption is itself an important risk factor for various health problems,³ it likely contributes to explain geographical variations in population health. Finally, knowing the risk factors and outcomes of alcohol consumption as well as its geographic distributions helps policy makers formulating targeted initiatives.

To examine geographic variations in the drinking styles of young adults is of particular importance because young adults – and especially young men – are a well known high risk group for detrimental alcohol consumption^{1,4}. Choosing sensible geographical units continues to be a vexing problem, however.⁵⁻⁶ Furthermore, geographical boundaries might be important for different reasons. For example, institutional units, like nations or states, are likely to be important because they determine alcohol policies that in turn impact alcohol consumption and related harm.⁷⁻⁹ Other units like functional micro regions, linguistic regions, and rural versus urban areas might influence drinking via economic conditions, social processes, or other exposures.¹⁰⁻¹² Previous research has predominantly focused on one of these different units at a time, however.^{2, 13-19} Furthermore, the studies examined various different aspects of drinking in adolescent and population samples and were mostly from English speaking countries. Thus, there are no studies of the high risk group of young men and it remains unclear which kind of geographical units are of relevance or to what degree they overlap in their influence on alcohol consumption.

In the present study, we assessed the relative importance of four types of geographical units in young Swiss men: institutional units, economic micro regions, linguistic regions, and urban vs. rural living. Switzerland is known for rather liberal alcohol policies at the national level⁸ while affording high legislative autonomy to its institutional subunits.²⁰ It thus might provide a natural laboratory for

studying the role of alcohol policies in geographical variations in alcohol consumption. Second, it is divided into economic micro regions that have experienced different economic conditions in recent years.²¹ Third, it is compartmentalized into different linguistic regions with differing patterns of alcohol consumption.²²⁻²³ Finally, as with virtually all Western countries, it is segregated into several metropolitan versus rural areas.

Our aims were 1) to evaluate prevalence rates of heavy alcohol consumption and their geographical variations across institutional units and micro regions, especially focusing on heavy weekend drinking as this has been found to be a major drinking style of young men;²⁴⁻²⁷ and 2) to determine how much of these variations is explained by linguistic regions, urban vs. rural living, institutional alcohol policies, and micro regional economic conditions. We expected (1) variations in alcohol consumption at both institutional and micro regional levels, (2) that some of these variations were explained by differences between the linguistic regions;²²⁻²³ (3) that urban/rural differences explained variations observed at cantonal and micro regional levels;^{13, 17, 28} (4) and that alcohol policies explained geographical variation at the institutional level.⁷⁻⁹ We made no predictions concerning the role of economic characteristics as previous results have been conflicting.^{12, 29-31}

METHODS

Data were extracted from the first wave of the ‘Cohort Study on Substance Use Risk Factors’ (C-SURF, approved by the Ethics Committee for Clinical Research at Lausanne University Medical School, protocol #15/07). This study took advantage of the fact that all Swiss men must present for potential military recruitment at roughly 19 years old, rendering virtually all young Swiss men eligible for study inclusion. The study recruitment centres covered 21 of 26 cantons. Data were collected from September 2010-March 2012 from subjects who had provided informed consent and completed a written questionnaire. Questionnaires were sent to the conscripts’ home address and total confidentiality was assured. Of a total of 7563 participants who gave informed consent to participate in the study, 5990 subjects (79.2%) completed the baseline questionnaire. Previous studies on sampling and response bias were published by Studer et al.³²⁻³³, indicating no substantial bias. Due to missing data, 111 participants were excluded, leading to an analytic sample of 5879 subjects.

Outcomes

Self reported frequency and usual quantity of alcohol consumption over the preceding 12 months were assessed separately for weekends (Friday-Sunday) vs. workweeks (Monday-Thursday). Pictures of standard drinks containing approximately 10-12 grams of pure alcohol were provided. A usual quantity of ≥ 5 standard drinks was considered ‘heavy drinking’.³⁴ We classified subjects as a ‘heavy weekend drinker’ if they reported heavy drinking on ≥ 1 weekend day monthly; and as a ‘heavy workweek drinker’ if they reported heavy drinking on ≥ 1 workweek day per month³⁵⁻³⁶. We additionally calculated the volume of drinking as a measure of total alcohol exposure.³ Workweek volume (workweek frequency x workweek quantity) and weekend volume (weekend frequency x weekend quantity) were summed to indicate the weekly volume, and any subject with a volume of ≥ 21 drinks per week was classified a ‘heavy volume drinker’.³⁷

Geographical units

Four types of geographical units were included. *Cantons* represent the highest level of institutional subunit in Switzerland and have considerable political autonomy.²⁰ Each *micro region*, defined by the Swiss Federal Statistical Office,³⁸ is a centre and its economic catchment area, among which the median population in 2011 was 58'650 (inter quartile range: 30'840–89'650). Micro regions are generally nested within cantons, but some cross cantonal borders. Participants were assigned their *urban/rural status* (core city vs. agglomeration of a core city vs. rural area) as per the Swiss Federal Statistical Office classification.³⁹ Participants were assigned to these geographical units by zip code and community of residence. Finally, participants were assigned to *linguistic regions* (French speaking vs. German speaking) based on the questionnaire language. Note that the linguistic regions were defined at the individual level by the participants' native language. Because the majority of participants (89.2%) was still living with their parents, we reasoned that this variable definition largely represented actual geographic areas and the cultural influence that is associated with them ²²⁻²³.

Explanatory variables

An overview checklist was obtained from the Swiss Federal Office of Public Health regarding eight different types of alcohol control policies implemented by cantons in 2011, which included 1) restrictions on *when* alcohol can be sold; 2) restrictions on *where* alcohol can be sold; 3) a turnover tax for on- and off-premise alcohol sellers; 4) so called 'syrup regulation' stating that on-premise alcohol outlets must provide at least one nonalcoholic beverage sold cheaper than the cheapest alcoholic drink; 5) restrictions on alcohol advertisements; 6) special protection measures for adolescents (these measures particularly include increasing the national minimum legal drinking age and restricting the service of adolescents at on-premise outlets in the evening and at night); 7) probes of purchases by underage persons to enforce underage drinking laws; and 8) prohibiting the dissemination of alcohol to underage persons by persons with legal access to alcohol. We created an index to rate cantonal alcohol policy strength by counting how many of the policies were implemented by each canton.⁸

We obtained two economic indicators of each micro region from the Swiss Federal Statistical Office that have been shown to identify region clusters with more or less favourable economic conditions:²¹ the percentage change in the number of available jobs (scaled to fulltime work); and the unemployment rate within 15-24 year olds. The overall change in number of jobs was available for 2001-2008, while the unemployment rate was available for the year 2010. The change in number of jobs was used to indicate whether participants came from a developing, stagnating, or deteriorating region, while unemployment rate was included as a context factor.¹²

We included age (continuous) and highest achieved level of education as individual level control variables.

Statistical analyses

We used generalized linear (logistic) mixed models to assess geographical variations in the binary (yes/no) outcomes "heavy weekend drinking", "heavy workweek drinking", and "heavy volume drinking". For each outcome, random effects were included at both cantonal and micro regional levels. Geographical variation was quantified using the estimated standard deviations and the median odds ratio of the two sets of random effects. Empirical Bayes estimates of random effects were computed for both geographical resolutions. This baseline model (model 1) was compared to an extended model (model 2) containing all study variables, with continuous explanatory variables centred around their means. For each explanatory variable, odds ratios (OR) with 95% confidence intervals and p-values for the null hypothesis OR=1.00 were computed. Statistical analyses were performed using R software⁴⁰ and the library lme4.⁴¹

RESULTS

The mean age of the participants was 20.0 years (standard deviation: 1.2, range: 17.9–28.5, table 1).

Participants came from 21 cantons and 77 micro regions (table 1).

Overall prevalence and geographical variations

Heavy weekend drinking was most prevalent (46.8%), with heavy volume drinking next (10.8%), and heavy workweek drinking least common (3.6%, table 2). The geographical variation of the outcomes differed. First, heavy weekend drinking and heavy workweek drinking varied at both cantonal and micro regional levels, whereas heavy volume drinking varied only at the cantonal level (table 2).

Cantonal variation was higher than micro regional variation in heavy weekend drinking, however, with the reverse observed for heavy workweek drinking.

Second, comparing the random effects of Models 2 and 1 (table 3) indicates that the types of alcohol consumption differed in the degree to which geographical variations were explained by linguistic regions, urban/rural status, and the other explanatory variables. Substantial variation was explained at the cantonal level in all outcomes (100% in heavy workweek drinking, 84.5% in heavy weekend drinking, and 82.1% in heavy volume drinking). On the other hand, micro regional variation was substantially reduced only for heavy weekend drinking (49.7%).

The roles of linguistic region, urban/rural status, cantonal alcohol policies and micro regional economic conditions

Linguistic regions were related to heavy workweek drinking (table 3) which was confined to German speakers (OR: 0.50, 95% CI 0.29-0.86, $p = 0.013$). Linguistic region explained 100% of cantonal variations beyond the other significant predictors (and 15.9% of micro regional variation, indicating a canton specific effect).

Concerning participants' *urban/rural status*, modest to substantial statistical evidence for an association was found for heavy weekend drinking only (OR agglomeration: 1.23, 95% CI 1.07-1.42, $p = 0.0044$, OR rural: 1.20, 95% CI 1.03-1.41, $p = 0.022$, table 3). Participants from rural and agglomeration areas had higher odds of heavy weekend drinking than those from cities. However, urban/rural status did not contribute substantially to explaining geographical variations in heavy weekend drinking (cantons: 5.1%, micro regions: 18.0%).

The index of *cantonal alcohol policies* exhibited an association with heavy weekend drinking with modest statistical evidence (OR: 0.93, 95% CI 0.88-0.99, $p = 0.018$), but it was not related to either heavy workweek or heavy volume drinking (table 3). Participants living in cantons with a higher number of policies exhibited lower odds of being a heavy weekend drinker. The index explained a substantial proportion of cantonal variation (57.3%) beyond the other significant predictors of heavy weekend drinking, and clearly less for micro regional variations (23.6%).

We found no statistical evidence of any relationships between *micro regional economic conditions* and alcohol consumption (table 3). This lack of relationships is consistent with micro regional variations being rather unaffected by the explanatory variables, as outlined above. Accordingly, economic conditions did not explain geographical variations to any substantial degree (-1.6% to 15.5%).

We carried out a complementary sensitivity analysis, varying the quantity and frequency thresholds used to define the outcome variables and re-calculating model 2 for each of these outcome variants. The analysis confirmed the results reported above (see online supplementary material). However, two refinements were indicated. First, living in agglomeration and rural areas was not related to heavy weekend drinking anymore when considering very high quantity thresholds (≥ 10 drinks). Second, the alcohol policy index turned out to be negatively related to low levels of volume drinking, whereas this relationship was gradually lost at higher levels of volume in line with our results reported in table 3.

DISCUSSION

Our results confirm that heavy weekend drinking, with a prevalence rate close to 50%, is a major drinking style among young adults.²⁴⁻²⁷ Heavy workweek drinking and heavy volume drinking, on the other hand, were additional risk behaviours engaged by a comparably smaller proportion of participants. The heavy occasional drinking that is characteristic for heavy weekend drinking was sometimes reported to be more prevalent in the Northern than in the Southern Europe.⁴² There is evidence, however, that a trend of convergence towards the drinking style of heavy occasional drinking among youths has started in Europe, additionally underscoring the relevance of this drinking style.⁴³

We found no shared pattern of geographical effects across the different types of alcohol consumption, however. Apparently, types of heavy consumption develop within different geographical boundaries. Thus, relevant geographical units and the driving factors behind them must be established separately across drinking behaviours. Furthermore, some drinking behaviours may be relatively insensitive to geographic areas, as heavy volume drinking exhibited only minimal geographical variation and was not explained by any central explanatory factor.

Nevertheless, several conclusions can be drawn. First, cantonal alcohol policies explained substantial variations between institutional subunits in heavy weekend drinking, and, beyond this effect, heavy weekend drinking also was more likely in rural and agglomeration areas. Both of these findings are in line with previous literature, demonstrating protective relationships of alcohol policies with alcohol consumption⁷⁻⁹ and heavier alcohol consumption in rural areas,^{13, 17, 28}.

Second, heavy workweek drinking was more prevalent in the German speaking region of Switzerland, and this difference explained all institutional variations. Thus, for heavy workweek drinking, linguistic regions played a major role. The finding is inconsistent, however, with previous research that identified higher alcohol consumption among Swiss francophones.²²⁻²³ A possible explanation is that

region specific consumption patterns might develop only later in life.⁴⁴ It would be interesting to study geographical variations in heavy drinking over time in future studies to address the possibly changing role of geographic influences over time.

Finally, despite the variability in the economic characteristics of the micro regions, the characteristics did not explain any geographical variation and were not related to alcohol consumption. This result adds to the conflicted picture, with different studies reporting different effects.^{12, 29-31} Future studies should reproduce our study in other countries with wider variation in economic development such as Germany, France or Spain, or possible entire Europe.

Our results shed new light on alcohol policies. They were related to heavy weekend drinking but not to heavy workweek or heavy volume drinking. Our conjecture is that these two behaviours are socially more constrained than heavy weekend drinking and, hence, have a higher threshold for engagement, as people must defy social norms. Consequently, only a highly determined core of drinkers might be willing to engage in these behaviours, and these individuals, in turn, might not be deterred by restrictions imposed by alcohol legislation.

That heavy workweek and heavy volume drinking are more socially constrained is compatible with their comparably low prevalence rates of 3.6% and 10.8%, respectively, versus a 46.8% prevalence of heavy weekend drinking. In addition, heavy weekend drinking was previously shown to constitute normal drinking behaviour in young Swiss men,²⁷ whereas heavy workweek and heavy volume drinking (that implies workweek drinking) interfere with educational and work duties and, therefore, are likely to be less accepted.²⁶ Furthermore, previous studies found that the number of alcohol policies implemented was less or not related to *more extreme* forms of drinking, but clearly related to moderate drinking behaviours in Western adolescents.^{7, 9} Whereas all of our drinking measures constituted heavy drinking, *within* our sample, the comparably more extreme forms were not related to alcohol policies, as were the heavy drinking behaviours in the adolescent samples. Thus, alcohol

policy strength seems to primarily operate on the less extreme and presumably more prevalent drinking behaviours in a population.

This interpretation suggests roughly three different groups of young drinkers. Those who: a) decisively abstain from drinking; b) have a high propensity to drink; and c) form the intermediate majority, with drinking behaviour that is somewhat spontaneous and pliable. It seems to be this last group that is primarily affected by policy making. An additional analysis excluding those 700 subjects who were heavy workweek drinkers and/or heavy volume drinkers (680 of whom were also heavy weekend drinkers) confirmed this. Recalculating model 2, the association between the alcohol policy index and heavy weekend drinking became stronger (OR: 0.91) and more robust (95% CI 0.85-0.96).

Implications for prevention

Our results suggest that alcohol policies are effective means for tackling heavy weekend drinking and, hence, should be implemented and enforced. In addition, rural and agglomeration areas should be prioritized. However, new measures are needed for less common forms of heavy drinking such as heavy workweek drinking and heavy volume drinking. Future research should clarify which subgroups are less affected by alcohol legislation and examine complementary prevention measures such as interventions tailored to heavy drinkers and individuals at high-risk for alcohol abuse⁴⁵⁻⁴⁷.

Limitations

This study has limitations, the first being its cross sectional design, which precludes determinations of causal relationships. Second, the sample focused on young men and thus results do not necessarily generalize to women or older people. Also, the degree to which the results generalize to other contexts, for example to Europe where bigger economic differences than between the Swiss micro-regions exist, is left to future research. Third, only those who provided informed consent participated, leading to potential self selection bias. Finally, the alcohol policy index was calculated by summing the implemented policies without considering different implementation intensities or empirical

effectiveness of the policies. Note, however, that such count indices have been found to valid in previous studies ⁴⁸⁻⁴⁹.

Conclusions

Different types of heavy alcohol consumption are determined by different geographical units, suggesting consumption specific aetiologies. Heavy weekend drinking is a major drinking style in young men. Alcohol policies protectively impact this drinking style, but not other forms of heavy drinking with low prevalence. Research and public health efforts must take into account these differences between types of alcohol consumption.

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CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

KEY POINTS

- This study is one of the first to examine heavy weekend drinking and other types of heavy alcohol consumption in young men on several geographical levels simultaneously
- Different types of heavy alcohol consumption were determined by different geographical units, suggesting consumption specific aetiologies
- Heavy weekend drinking was a major drinking style of the young men
- Alcohol policies had a protective association with this drinking style, but not with other low prevalence types of heavy drinking
- Alcohol policies should be implemented and enforced to tackle heavy weekend drinking with a priority on rural areas, but complementing approaches are needed for less common forms of heavy alcohol consumption

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Table 1: Baseline characteristics and alcohol consumption of participants

	Mean \pm SD (range)	n (%)	Heavy weekend drinking (prevalence in %)	Heavy workweek drinking (prevalence in %)	Heavy volume drinking (prevalence in %)
Individual-level (n = 5879)					
Age ^a	20.0 \pm 1.2 (17.9-28.5)				
< 20		3483 (59.2)	47.9	3.2	11.1
\geq 20		2396 (40.8)	40.6	4.2	10.2
Education	-				
Primary school		2942 (50.0)	45.9	3.4	10.1
Higher vocational school		1711 (29.1)	46.2	4.1	13.7
High school/university		1226 (20.9)	40.8	3.4	8.1
Linguistic region	-				
German		2616 (44.5)	47.9	4.6	11.1
French		3263 (55.5)	42.5	2.9	10.4
Urban/rural status	-				
City		1272 (21.6)	39.7	3.0	10.3
Agglomeration		2689 (45.8)	45.5	4.2	9.9

Rural		1918 (32.6)	47.5	3.3	12.2
Cantonal-level (n = 21)					
Participants per canton	279.9 ±288.9 (5-1105)				
Cantonal alcohol policies ^a	3.5 ±1.6 (0.0-6.0)				
< 3.5		1630 (27.7)	50.3	3.7	11.0
≥ 3.5		4249 (72.3)	42.8	3.6	10.6
Micro-regional-level (n = 77)					
Participants per micro region	76.4 ±104.9 (1-749)				
Economic development in micro regions 2001-2008 ^a	5.4 ±6.9 (-13.1-26.8)				
< 5.22		1681 (28.6)	48.2	4.2	11.2
≥ 5.22		4198 (71.4)	43.6	3.4	10.5
Youth unemployment rate in micro regions 2010 ^a	4.1 ±2.1 (1.0-10.0)				
< 3.95		1057 (18.0)	49.4	5.1	11.0
≥ 3.95		4822 (82.0)	43.9	3.3	10.7

^a Age, the index of cantonal alcohol policies, economic development in the micro regions, and youth unemployment rates in the micro regions were dichotomized for this analysis. The policy index was dichotomized around its median value for cantons; micro regional variables were dichotomized around their medians by micro region.

Table 2: Estimates of overall prevalence rates and their range across geographic units for different types of alcohol consumption, sorted by rate magnitude.

	Overall prevalence (%) ($n_{\text{participants}} = 5879$)	Range Cantons ($n_{\text{cantons}} = 21$)	Range Micro regions ($n_{\text{micro-regions}} = 77$)
Heavy weekend drinking	46.8	41.1 - 52.1	43.9 - 50.3
Heavy volume drinking	10.8	9.4 - 12.5	10.7 - 10.8
Heavy workweek drinking	3.6	2.9 - 4.4	2.8 - 5.8

Table 3: Results of generalized linear logistic mixed models predicting heavy weekend drinking, heavy volume drinking, and heavy workweek drinking.

	Heavy weekend drinking			Heavy volume drinking			Heavy workweek drinking		
Model 1:									
Random effects	SD		MOR	SD		MOR	SD		MOR
Cantons	0.19		1.20	0.15		1.15	0.24		1.26
Micro regions	0.12		1.12	0.02		1.02	0.32		1.36
Model 2:									
Random effects	SD		MOR	SD		MOR	SD		MOR
Cantons	0.08		1.07	0.06		1.06	0.00		1.00
Micro regions	0.09		1.09	0.00		1.00	0.30		1.33
Explanatory variables	OR	95% CI	p-value	OR	95% CI	p-value	OR	95% CI	p-value
Linguistic regions									
(ref: German speaking)									
French speaking	1.06	0.85 - 1.32	0.62	0.88	0.66 - 1.19	0.41	0.50	0.29 - 0.86	0.013
Urban/rural status									
(ref: city)									
Agglomeration	1.23	1.07 - 1.42	0.0044	0.94	0.75 - 1.17	0.57	1.44	0.97 - 2.14	0.070

Rural	1.20	1.03 - 1.41	0.022	1.15	0.90 - 1.46	0.27	1.12	0.71 - 1.77	0.62
Index of cantonal alcohol policies	0.93	0.88 - 0.99	0.018	1.02	0.94 - 1.10	0.65	0.97	0.84 - 1.11	0.64
Economic development in micro regions 2001-2008	0.99	0.98 - 1.01	0.32	1.00	0.98 - 1.01	0.72	0.99	0.95 - 1.02	0.37
Youth unemployment rate in micro regions 2010	0.98	0.93 - 1.03	0.43	1.04	0.96 - 1.11	0.33	1.03	0.89 - 1.18	0.73
Age (in years)	0.88	0.84 - 0.92	<0.0001	0.92	0.85 - 0.99	0.031	1.14	1.02 - 1.27	0.019
Education (ref: Primary school)									
Higher vocational school	1.11	0.98 - 1.26	0.098	1.49	1.23 - 1.81	<0.0001	1.24	0.89 - 1.72	0.19
High school/university	0.96	0.83 - 1.11	0.56	0.85	0.66 - 1.09	0.19	1.10	0.74 - 1.63	0.64

Note: $n_{\text{participants}} = 5879$, $n_{\text{cantons}} = 21$, $n_{\text{micro-regions}} = 77$ in all models. SD: standard deviation. MOR: median odds ratio. OR: odds ratio. CI: confidence interval.

Geographical variation was quantified using the estimated standard deviations of the random effects of cantons and micro regions. Odds ratios were computed for the explanatory variables. Odds ratios written in bold are considered statistically significant.